

JAN 12 2007

Application No.: 10/621620

Case No.: 57901US005

Amendments to the Claims:

The following Listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A microneedle device comprising:  
a substrate comprising a first major surface; and  
at least one microneedle projecting from the first major surface of the substrate, the at least one microneedle comprising a base proximate the first major surface of the substrate, wherein the at least one microneedle is tapered from the base to a solid flat tip distal from the base such that the at least one microneedle comprises a truncated tapered shape;  
wherein the solid flat tip comprises a surface area measured in a plane aligned with the base of 20 square micrometers or more and 250 square micrometers or less.
2. (Original) A device according to claim 1, wherein the at least one microneedle comprises a plurality of microneedles.
3. (Original) A device according to claim 1, wherein the flat tip comprises a surface area of 100 square micrometers or less.
4. (Original) A device according to claim 1, wherein the flat tip comprises a surface area of 50 square micrometers or less.
5. (Original) A device according to claim 1, wherein the at least one microneedle comprises a height above the first major surface and a maximum base dimension, the height and the maximum base dimension ratio defining an aspect ratio, wherein the aspect ratio is 2:1 or more.
6. (Original) A device according to claim 1, wherein the at least one microneedle is formed of one or more polymers.

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7. (Original) A device according to claim 1, wherein the base of the at least one microneedle comprises a base area of 900 square micrometers or more.

8. (Currently Amended) A microneedle device comprising:

a substrate comprising a first major surface; and

a plurality of microneedles projecting from the first major surface of the substrate, each microneedle of the plurality of microneedles comprising a base proximate the first major surface of the substrate, wherein each microneedle of the plurality of microneedles is formed of one or more polymers and is tapered from the base to a solid flat tip distal from the base such that each microneedle of the plurality of microneedles comprises a truncated tapered shape;

wherein the solid flat tip comprises a surface area measured in a plane aligned with the base of 20 square micrometers or more and 100 square micrometers or less;

wherein the base of each microneedle of the plurality of microneedles comprises a base area of 900 square micrometers or more;

and wherein each microneedle of the plurality of microneedles comprises a height above the first major surface and a maximum base dimension, the height and the maximum base dimension ratio defining an aspect ratio, wherein the aspect ratio is 3:1 or more.

9. (Currently Amended) A microneedle device comprising:

a substrate comprising a first major surface; and

at least one microneedle projecting from the first major surface of the substrate, the at least one microneedle comprising a base proximate the first major surface of the substrate, wherein the at least one microneedle is tapered from the base to a solid tip distal from the base such that the at least one microneedle comprises a truncated tapered shape having a height (h) above the first major surface as measured from the base to the tip;

wherein the at least one microneedle comprises a solid cross-sectional area of 20 square micrometers or more and less than a base area of the at least one microneedle, where the solid cross-sectional area is measured in a plane aligned with the base, the plane being located at a distance of 0.98h from the base.

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10. (Original) A device according to claim 9, wherein the at least one microneedle comprises a plurality of microneedles.

11. (Previously Amended) A device according to claim 9, wherein the solid cross-sectional area comprises 25% or less of the base area.

12. (Previously Amended) A device according to claim 9, wherein the solid cross-sectional area comprises 100 square micrometers or less.

13. (Original) A device according to claim 9, wherein the at least one microneedle comprises a height (h) above the first major surface and a maximum base dimension, the height and the maximum base dimension ratio defining an aspect ratio, wherein the aspect ratio is 2:1 or more.

14. (Original) A device according to claim 9, wherein the at least one microneedle is formed of one or more polymers.

15. (Original) A device according to claim 9, wherein the base of the at least one microneedle comprises a base area of 900 square micrometers or more.

16. (Currently Amended) A microneedle device comprising:

a substrate comprising a first major surface; and

a plurality of microneedles projecting from the first major surface of the substrate, each microneedle of the plurality of microneedles comprising a base proximate the first major surface of the substrate, wherein each microneedle of the plurality of microneedles is formed of one or more polymers and is tapered from the base to a solid flat tip distal from the base such that each microneedle of the plurality of microneedles comprises a truncated tapered shape;

wherein each microneedle of the plurality of microneedles comprises a solid cross-sectional area of 20 square micrometers or more and 25% or less of a base area of each microneedle of the plurality of microneedles, where the solid cross-sectional area is measured in a plane aligned with the base, the plane being located at a distance of 0.98h from the base;

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wherein the base of each microneedle of the plurality of microneedles comprises a base area of 900 square micrometers or more;

and wherein each microneedle of the plurality of microneedles comprises a maximum base dimension, the height and the maximum base dimension ratio defining an aspect ratio, wherein the aspect ratio is 3:1 or more.

17. (Original) A method of using a microneedle device, the method comprising:

- providing a microneedle device according to claim 1;
- contacting the skin on a patient with the at least one microneedle;
- forcing the microneedle device against the skin.

18. (Original) A method of using a microneedle device, the method comprising:

- providing a microneedle device according to claim 9;
- contacting the skin on a patient with the at least one microneedle;
- forcing the microneedle device against the skin.

19.-40. (Withdrawn)